

INDEX TO VOLUME XX, 1920

SCHOOL SCIENCE AND MATHEMATICS

A Journal for All Science and Mathematics Teachers

Founded by C. E. Linebarger

SMITH & TURTON, Publishers

Publication Office, Mount Morris, Illinois

CHICAGO OFFICE, 2059 East 72nd Place, CHICAGO, ILL.

CHARLES H. SMITH

EDITOR

Hyde Park High School, Chicago

CHARLES M. TURTON

BUSINESS MANAGER

Bowen High School, Chicago

DEPARTMENTAL EDITORS

Agriculture—Aretas W. Nolan
The University of Illinois, Urbana, Ill.
Astronomy—George W. Myers
The University of Chicago
Biology, Research in—Homer C. Sampson
The Ohio State University, Columbus
Botany—Worrall Whitney
Hyde Park High School, Chicago
Chemistry—Frank B. Wade
Shortridge High School, Indianapolis, Ind.
Chemistry, Research in—B. S. Hopkins
The University of Illinois, Urbana, Ill.
Geography—William M. Gregory
Normal Training School, Cleveland, Ohio

General Science—Fredric D. Barber
State Normal University, Normal, Ill.
Mathematics—Herbert E. Cobb
Lewis Institute, Chicago
Mathematics Problems—Joseph A. Nyberg
Hyde Park High School, Chicago
Physics—Willis E. Tower
Englewood High School, Chicago
Physics, Research in—Homer L. Dodge
The State University of Oklahoma, at Norman. Representing American Physical Society
Science Questions—Franklin T. Jones
Warner and Swasey Co., Cleveland, Ohio
Zoology—Harold B. Shinn
Schurz High School, Chicago

Published Monthly October to June, Inclusive, at Mount Morris, Illinois
Price, \$2.50 Per Year; 30 Cents Per Copy

Entered as second-class matter March 1, 1913, at the Post Office at Mount Morris, Illinois, under the Act of March 3, 1879

76
V
GENERAL

Vol. XX. No. 1

Whole No. 165

JANUARY 1920

70
GENERAL LIBRARY
JAN 15 1920
UNIV. OF MICH.

SCHOOL SCIENCE AND MATHEMATICS

A Journal for All Science and Mathematics Teachers

Founded by C. E. Linebarger

SMITH & TURTON, Publishers

Publication Office, Mount Morris, Illinois

CHICAGO OFFICE, 2059 East 72nd Place, CHICAGO, ILL.

CHARLES H. SMITH

EDITOR

Hyde Park High School, Chicago

CHARLES M. TURTON

BUSINESS MANAGER

Bowen High School, Chicago

DEPARTMENTAL EDITORS

Agriculture—Aretas W. Nolan
The University of Illinois, Urbana, Ill.

Astronomy—George W. Myers
The University of Chicago

Biology, Research in—Homer C. Sampson
The Ohio State University, Columbus

Botany—

Chemistry—Frank B. Wade
Shortridge High School, Indianapolis, Ind.

Chemistry, Research in—B. S. Hopkins
The University of Illinois, Urbana, Ill.

Earth Science—William M. Gregory
Normal Training School, Cleveland, Ohio

General Science—Fredric D. Barber
State Normal University, Normal, Ill.

Mathematics—Herbert E. Cobb
Lewis Institute, Chicago

Mathematics Problems—Jasper O. Hassler
*Crane Technical High School
and Junior College, Chicago*

Physics—Willis E. Tower
Englewood High School, Chicago

Physics, Research in—Homer L. Dodge
The State University of Oklahoma, at Norman. Representing American Physical Society

Science Questions—Franklin T. Jones
Warner and Swasey Co., Cleveland, Ohio

Zoology—Worrall Whitney
Hyde Park High School, Chicago

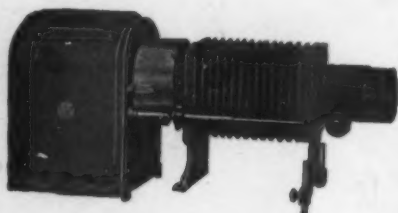
Published Monthly October to June, Inclusive, at Mount Morris, Illinois
Price, \$2.50 Per Year; 30 Cents Per Copy

"McIntosh Lanterns Are Honest Lanterns."

Lantern Slides of Science

A copy of our Catalogs of science slides was mailed when published to every member of the Central Association. Are you a member? Did you get your copy? Did you keep it?

If not, there is another copy for you if you are interested. Just write us a card and ask for it. No obligation. You'll need it in placing your orders for science slides.



Lanterns from \$36.00 up.
Opaque and micro projectors,
slides and accessories.

McINTOSH STEREOPTICON
COMPANY
410 Atlas Block, CHICAGO, ILL.

For Next Semester

Moore and Halligan—PLANT PRODUCTION

—Agronomy and Horticulture

Mayne and Hatch—HIGH SCHOOL AGRICULTURE

—General Treatment

Coulter—PLANT LIFE AND PLANT USES

—Practical Botany—Not too Technical

Hunter—CIVIC BIOLOGY

—Community Welfare

Dryer—HIGH SCHOOL GEOGRAPHY

—Physical—Economic—Regional

Clark—INTRODUCTION TO SCIENCE

—A real general science.

New York
Chicago
Cincinnati
Boston
Atlanta

AMERICAN BOOK COMPANY

330 East Twenty-second Street

CHICAGO, ILLINOIS

Please mention School Science and Mathematics when answering Advertisements.

INDEX BY TITLES

A

Absolute Zero, A Suggestion for Teaching. G. W. WARNER.....	361
Acceleration Apparatus for Measuring "G" and the Laws of Falling Bodies, Free Fall Machine or. I. THORNTON OSMOND.....	602
Acoustic Chart, Stansico Correlated. STANDARD SCIENTIFIC COMPANY.....	746
Acoustical Principles, Some Everyday Applications of. F. R. WATSON.....	193
Advertising Committee, Report of the, C. A. S. & M. T. GEORGE TYPE.....	233
Aerial Photography, Mapping by. W. H. SPURGIN.....	488
Agricultural Organization and Home Project Work. The Educational Basis for Junior. JAS H. GREENE.....	788
Air Condition in School Buildings. S. R. LEWIS.....	448
Air Pressure, Common Evidences. STEPHEN S. VISHNER.....	608
Alaska Coal. Increased Output of. U. S. GEOL. SURVEY.....	173
American Teaching Methods. Assails. ROBERT E. ROSE.....	868
Aquaria for the School Laboratory, Salt Water. MYRTLE E. JOHNSON.....	779
Area of the United States, Dimensions and. U. S. GEOL. SURVEY.....	750
Arizonia. JEHIEL S. DAVIS.....	57
Articles in Current Periodicals.....	85, 185, 275, 468, 649, 768, 866
Asphalt in the United States. A Great Undeveloped Resource. U. S. GEOL. SURVEY.....	576
Association of Teachers of Secondary Mathematics in North Carolina, Meeting of.....	378
Astronomical Distances, Calculation by Geometry. JOSEPH V. COLLINS.....	416
Atomic Theory in Baseball Terms. IRVING LANGMUIS.....	548
Aurora of March 22, 1920, The. LEWIS J. BOSS.....	487
Automobile in Physics, The. H. C. KRENERICK.....	197

B

Biology Section, Minutes of the C. A. S. & M. T.....	238
Biology. Teachers on Recommendations for a New Course of Study for the High Schools of Chicago, Report of. JEROME ISENBARGER.....	642
Bird Study in the Mississippi Valley. HORACE GUNTROP.....	383
Bookkeeping by the Historical Method, Teaching. A. P. R. DRUCKER.....	70
Book Reviews.....	96, 188, 278, 374, 472, 560, 656, 770, 866
Book Reviews—	
A Handbook of American Private Schools. CHARLES H. SMITH.....	192
American Red Cross in the Great War. CHARLES H. SMITH.....	774
Analytic Geometry. HERBERT E. COBB.....	560
Animal Husbandry. CHARLES H. SMITH.....	774
An Introductory Course in Quantitative Chemical Analysis. FRANK B. WADE.....	281
Applied Arithmetic. HERBERT E. COBB.....	664
Applied Mathematics. HERBERT E. COBB.....	666
Applied Science for Metal Workers. CHARLES H. SMITH.....	196
Applied Science for Wood Workers. CHARLES H. SMITH.....	190
Armenia and the Armenians. CHARLES H. SMITH.....	656
A Short Course in College Mathematics. HERBERT E. COBB.....	278
Brightness and Dullness in Children. FRANK N. FREEMAN.....	474
Catalogue of Spencer Microscopes. CHARLES H. SMITH.....	474
College Textbook of Chemistry. FRANK B. WADE.....	282
Correlated Mathematics for Junior Colleges. HERBERT E. COBB.....	278
Dietetics for High Schools. CHARLES H. SMITH.....	278
Div-a-let. HERBERT E. COBB.....	278
Elementary Biology, An Introduction to the Science of Life. WORRELO WHITNEY.....	280
Elements of Victor Algebra. HERBERT E. COBB.....	666

Engineering Application of Higher Mathematics. CHARLES H. SMITH.....	192
Everyday Chemistry. HERBERT R. SMITH.....	561
Every Step in Canning. CHARLES H. SMITH.....	474
Examples in Magnetism. CHARLES H. SMITH.....	192
Exercises in Chemistry. FRANK B. WADE.....	283
Experimental Organic Chemistry. FRANK B. WADE.....	660
Fundamentals of High School Mathematics. HERBERT E. COBB.....	558
General Botany. HENRY S. CONRAD.....	558
General Mathematics. HERBERT E. COBB.....	374
Household Arithmetic. HERBERT E. COBB.....	664
Infinitesimal Calculus. HERBERT E. COBB.....	666
Intermediate Text Book of Chemistry. FRANK B. WADE.....	376
Introduction to Vocational Education. CHARLES H. SMITH.....	772
Laboratory Manual of Elementary Colloid Chemistry. FRANK B. WADE.....	660
Lighting from Concealed Sources. CHARLES H. SMITH.....	866
Modern Junior Mathematics. HERBERT E. COBB.....	375
Number by Development. HERBERT E. COBB.....	278
Number by Development Vol. III Grammar Grades. HERBERT E. COBB.....	664
Plane Geometry. HERBERT E. COBB.....	376
Plane Trigonometry for Secondary Schools. HERBERT E. COBB.....	666
Plant Production. WORROLO WHITNEY.....	280
Practical Physics. CHARLES H. SMITH.....	774
Principal of Agriculture for High Schools. CHARLES H. SMITH.....	192
Psychology from the Standpoint of a Behaviorist. CHARLES H. SMITH.....	472
Qualitative Analysis. FRANK B. WADE.....	96
Second Course in Algebra. HERBERT E. COBB.....	664
South. CHARLES H. SMITH.....	772
Teaching Home Economics. CHARLES H. SMITH.....	190
The Blind, Their Condition and the Work Being Done for Them in the United States. CHARLES H. SMITH.....	188
The Elements of Physics. CHARLES H. SMITH.....	772
The High School Boy and His Problems. CHARLES H. SMITH.....	662
Vocational Agricultural Education by Home Projects. WORROLO WHITNEY.....	280
What Will Metric Standardization Cost? CHARLES H. SMITH.....	662
Zoology, a Textbook for Colleges and Universities. HAROLD B. SHRINE.....	657
Books Received.....	96, 187, 277, 470, 559, 654
Botany, Introductory Courses in. BRADLEY M. DAVIS.....	52, 352, 692
Brocard Points, Determination of the. J. CARL KAMPLAIN.....	51

C

Cadmium in 1919, Production of. U. S. GEOL. SURVEY.....	391
Cajoris History of Mathematics, Second List of Marginal Notes on. G. A. MILLER.....	300
California Science and Mathematics Association, Southern. N. D. KNUFF.....	558
Central Association of Science and Mathematics Teachers, Minutes of the 1919 Annual Meeting of the. HARRY O. GILLET.....	232
Central Association of Science and Mathematics Teachers, 1920 Officers of the.....	184
Chain Hoist, The Differential Pulley or. W. F. ROECKER.....	142
Charts for Prose Problems, The Use of. JOS. A. NYBERG.....	619
Chemical Nomenclature and Pronunciation. J. NORMAN TAYLOR.....	850
Chemical Warfare Service and Chemical Teaching. WILLIAM MCPHERSON.....	200
Chemistry, A High School Course in Trade. EDWIN G. PIERCE.....	27
Chemistry for Girls, The Outline of a Course in Practical. CHARLES E. DULL.....	841

Chemistry, Research in. B. S. HOPKINS.....	392, 501, 571, 673
Chemistry Section, Minutes of the C. A. S. & M. T. HARRY M. MESS.....	240
Chemistry Teacher Know, What Should the. FRANK B. WADE.....	403
Clark Agency, Minnesota Superintendent to Manage.....	363
Classroom Activities in Science, Outside. L. C. FELDMAN.....	700
Class Room Sayings.....	269, 256, 747
Coal Industry, Bituminous. U. S. GEOL. SURVEY.....	461
Coal Mining in Alaska. U. S. GEOL. SURVEY.....	565
College Entrance Examination Board Questions in Chemistry. HENRY L. GERRY.....	845
College Mathematics, Freshman. E. E. WATSON.....	531
Color Blindness, Test for. MAUD S. STUART.....	553
Commercial Education, A Survey Report of. SCHOOL REVIEW.....	182
Commercial Geography as Vocational Guidance. ANDREW NICHOLS.....	706
Copper, Alaska Produces 70 Million Pounds of. U. S. GEOL. SURVEY.....	150
Cubic Equations by Straight Line Graphs, Solution of. M. G. SCHUCKER.....	818

D

Decay of Mountains and Formation of Soils, The. LYMAN C. WOOSTER.....	792
Desk With a Vertical Filing System for Showing Apparatus, A Port- able Science Demonstration. CHARLES W. FINLEY and EARL R. GLENN.....	782
Determinants, A Study of. C. M. HIMEL and C. A. STONE.....	855
Development of Mathematical Ideas, Numerically and Geometrically The Parallel. LOUIS C. KARPINSKI.....	821
Differential Pulley or Chain Hoist, The. W. F. ROECKER.....	142
Diffraction Grating, Hilger. ADAM HILGER & Co.....	762
Directory of Science and Mathematics Societies.....	284, 566, 668
Discipline of Expression, The. MAX J. HERZBERG.....	697
Dismal Swamp of Virginia and North Carolina, The. U. S. GEOL. SURVEY.....	437
Distance Problems, Time Rate and. JOS. A. NYBERG.....	539

E

Earth Science in the Reorganized High School, Report of the Com- mittee on. JAMES H. SMITH.....	256
Editorial Notice.....	272
Educational Function and Value, Classification of School Subjects Based on. LYMAN C. WOOSTER.....	550
Educational Notes. GINN AND COMPANY.....	186
Einstein's Theory of Gravitation from the Standpoint of the Teacher of Physics. DR. JOSEPH S. AMES.....	477
Electron and the Building of Atoms, The Positive. WILLIAM D. HASKINS.....	392, 501
Electron in Elementary Physics, The Use of the. DANIEL L. RICH.....	220
Engineering and Science in Shipbuilding, The Application of. GEORGE D. ROALFE.....	801
English Expression in its Relation to Teaching of Science. R. R. SMITH.....	341
English in Science Courses, The Use of. E. H. JOHNSON.....	14
Examinations and Tests, A Study of. MABEL W. ARLEIGH.....	629
Excursions, Report on C. A. S. & M. T.....	237

F

Federal Aid to Soldiers. PUBLIC HEALTH SERVICE.....	326
Field Trips, Notes on Managing. ELLIS C. PERSING.....	797
Florida Freeze on Insects, Effect of a MONTHLY WEATHER REVIEW.....	758
Ford Educational Library.....	852
Fundamentals in Method—Old and New. CHARLES J. PIEFER.....	409

G

Gage, A New Direct Reading Vacuum. W. H. FARR.....	495
--	-----

Gasoline from Natural Gas. U. S. GEOL. SURVEY.....	19
General Science and the Teacher Training it Involves, The Rôle of Laboratory Work in. HERBERT BROWNELL.....	317
General Science and Vocational Education. A. W. NOLAN.....	454
General Science, A Textbook for. NEIL E. GORDON.....	419
General Science in the High School, The Place of. JOHN CALVIN HANNA.....	516
General Science of the Future, The. G. M. RUCH.....	423
General Science, Possibilities of Home Work in. G. A. BOWDEN.....	327
General Science Section, Minutes of the C. A. S. & M. T. ADA L. WECKEL.....	257
General Science, Some Tangible Results from a Course in. GEORGE MOUNCE.....	632
Geography as a Fundamental High School Subject, Steps Necessary to Establish. F. E. WILLIAMS.....	347
Geography as a Means of Improving its Teaching, Conservative Work in. ALISON E. AITCHISON.....	499
Geography in the High School, Scope of. JOHN CALVIN HANNA.....	214
Geography Section, Minutes of the C. A. S. & M. T. ANNE B. ROY- STON.....	251
Geography, Some Important Phases of. FRED K. BRANOM.....	157
Geography Teachers, Aims of Modern. E. E. LACKEY.....	872
Geology and War. U. S. GEOL. SURVEY.....	876
Geometric Recreation, A. ISABEL HARRIS.....	731
Good Yeast, How to Tell. LEONARD K. HIRSHBERG.....	820
Group Tests, Formula for. HAROLD S. HULBERT.....	147

H

Higher Salaries for Teachers, A Plea for. CHICAGO HIGH SCHOOL TEACHER CLUB.....	141
High School Course in Chemistry Meet the Demands of Vocational Chemistry? How Does the Present. FRANK B. WADE.....	313
High School Course of Study and Methods of Teaching Mathematics, Some Factors Affecting the Selection of the. H. R. DOUGLAS.....	287
High School Geography? What Changes Should be Made in Our Methods of Teaching. W. R. MCCONNELL.....	117
High School Physics, A Project in Electricity for. HIRAM W. ED- WARDS.....	459
High School Science, The Reorganization of. GEORGE R. TWISS.....	1
Highway and Highway Transport Education Conference. U. S. COM. OF EDUCATION.....	644
History of Mathematical Ignorance, Value of the. G. A. MILLER.....	813
Hollow Building Tile Growing in Favor.....	33
Holy Land, The. F. RENWICK.....	143
Home Economics Section, Minutes of the C. A. S. & M. T. SYBIL WOODRUFF.....	261

I

Industrial Art Schools.....	742
Intelligence Testing in the Department of Physics, University of Chicago, Preliminary. HARVEY B. LEMON.....	226
Intelligence Tests, Development of Group.....	91

J

Junior High School Mathematics, Up-to-Date Problems in. THEO- DORE LINDQUEST.....	305
--	-----

L

Laboratory Work in General Science and the Teacher Training It Involves, The Rôle of. HERBERT BROWNELL.....	317
Laboratory Work, Variety is the Spice of. C. C. LEESON.....	752
Lake Tahoe Has Shrunk. U. S. GEOL. SURVEY.....	750
Langmuir Receives Nichols Medal. DR. IRVING.....	564

Light for Retouching. PHOTO-ERA.....	391
Logarithms and Slide Roles, Talk on. FLORIAN CAJORI.....	527
Logarithms and the Slide Role in the Ninth Grade, The Teaching of. C. EBEN STROMQUIST.....	624

M

Manufacturers Desire the Metric System, American. WORLD TRADE CLUB.....	33
Mapping by Aerial-Photography. W. H. SPURGIN.....	488
Mathematics as a Factor in Education, The Claims of. C. N. MOORE.....	438
Mathematics for High School, Applied. EUGENE H. BARKER.....	531
Mathematics, Freshman College. E. E. WATSON.....	714
Mathematics of Elementary Physics, The. PHILO F. HAMMOND.....	264
Mathematics Section, Minutes of the C. A. S. & M. T. ELISIE G. PARKER.....	287
Mathematics, Some Factors Affecting the Selection of the High School Course of Study and Methods of Teaching of. H. R. DOUGLAS.....	125
Mathematical Subjects, Correlation of. E. R. BRESLICH.....	382
Mathematics Teachers, The National Council of. ALFRED DAVIS.....	305
Mathematics, Up-to-Date Problems in Junior High School. THEO- DORE LINDQUEST.....	457
Math. Quest, The. HELEN WHITAKER.....	233
Membership Committee, Report of the C. A. S. & M. T. CHARLES S. WINSLOW.....	182
Metric Standardization Easy; Not Expensive, Large Steel Manu- facturer Declares. WORLD TRADE CLUB.....	156
Metric Standardization, Ninety-Nine Per Cent Favor. WORLD TRADE CLUB.....	13
Metric Systems, School Children Demand. WORLD TRADE CLUB....	65
Metric Units—Advertising Men Need. WORLD TRADE CLUB.....	514
Molecular Motion, Illustration of. J. NORMAN TAYLOR.....	172
Monkey Stops Climbing, The. WILLIAM F. RIGGE.....	

N

National Academy of Sciences.....	363
National Committee on Mathematical Problems, Notes and News Concerning the Work of, The. J. W. YOUNG.....	92, 754, 764
National Committee on Mathematical Requirements, The.....	476
National Research Council. CARNEGIE CORPORATION.....	312, 362
Natural Gas, Gasoline from. U. S. GEOL. SURVEY.....	19
Nature Study in the Elementary School Curriculum, The Place of. S. H. WILLIAMS.....	838
Negatives, A Note on. FRANK H. McMAKIN.....	640
Nitrogen, Activated. L. V. ANDEREGG.....	571
Nitrogen, The Disintegration of. R. W. MILLER.....	512

O

Oil Drilling in Alaska. U. S. GEOL. SURVEY.....	100
Oil Industry, Government in Touch With. U. S. GEOL. SURVEY.....	181
Oil Wells in South Central Arkansas, Promising. U. S. GEOL. SURVEY.....	696

P

Pascal's "New Experiments on Vacuum." WILLARD J. FISHER.....	723
Passive State; A Review of the Theories, The. J. N. REEDY.....	673
Peat, Uses of. U. S. GEOL. SURVEY.....	876
Pedagogy, The New.....	874
Phosphate Rock, Large Production of.....	364
Physical Equipment of the School Building in Classroom Instruction, The Use of. DEAN E. S. KEENE.....	577
Physical Tests. MARION D. WESTON.....	577
Physics, Research in. HOMER L. DODGE.....	477, 681
Physics Section, Minutes of the C. A. S. & M. T. A. W. AUGER.....	266

Physics Teacher Know? What Should the. C. L. VESTAL.....	151
Physics Test. C. P. FINGER.....	472
Physiology in Our Schools. W. E. NELSON.....	166
Plant Protection Institute. NATIONAL RESEARCH COUNCIL.....	749
Platinum from Alaska. U. S. GEOL. SURVEY.....	134
Plus and Minus Signs in Algebra. JOS. A. NYBERG.....	435
Potash Deposits in Germany, The Great. U. S. GEOL. SURVEY.....	494
Potash Deposits in Spain. U. S. GEOL. SURVEY.....	515
Potash Deposits of Alsace, The. U. S. GEOL. SURVEY.....	641
Pottery Industry in 1918, The. U. S. GEOL. SURVEY.....	91
Prier in His Relation to Natural Science. John Larsen. H. J. VAN CLEVE.....	652
Problem and its Numerical Solution, A. W. W. SLEATER.....	612
Problem Department. J. O. HASSLER.....	86, 174, 270
Problem Department. J. A. NYBERG.....	365, 465, 554, 637, 743, 854
Problems for the Classroom from the Orientation Work of the A. E. F., Some. C. A. EPPERSON.....	210
Problems of Algebra, Prose. JOS. A. NYBERG.....	829
Project as a Method of Teaching, The. ROLLAND M. STEWART.....	594
Project as a Teaching Method, The. R. W. SHARPE.....	20
Project in Electricity for High School Physics. HIRAM W. EDWARDS.....	459
Project Method in High School Mathematics, Some Applications of the. EDITH ST. JOHN EATON.....	443
Project in Science Teaching, Utilization of the Chance. FRANK B. WADE.....	775
Projects in High School Mathematics, A Few Live. FRANK M. RICH.....	34
Publishers Announcement.....	209, 365

Q

Quadratic Equation, The Character of the Roots, of a. ROBERT E. MORITZ.....	433
Quick Silver in 1918. U. S. GEOL. SURVEY.....	84
Quick Silver Produced in the United States. U. S. GEOL. SURVEY.....	636

R

Radio-Waves, The Production of Damped. WILLIAM SCHRIEVER.....	681
Railway and Steamship Maps, Report of the Committee on C. A. S. & M. T. J. PAUL GOODE.....	234
Range of Information Test in Science Revised, The. ELLIOT R. DOWNING.....	77
Rate and Distance Problems, Time. JOS. A. NYBERG.....	539
Red Cross—Why the Colleges Should Support the Red Cross. AMER- ICAN.....	870
Relation Between the Three Sides of a Right Triangle, Some Inter- esting Facts Concerning the. ROBERT R. KNOWLES.....	562
Reorganization of High School Science, The. GEORGE R. TWISS.....	1
Roots of a Quadratic Equation, The Character of the. ROBERT E. MORITZ.....	433

S

San Diego, California, Water Supply for. U. S. GEOL. SURVEY.....	112
School Bonds at Tulsa, Okla., Issue.....	312
School Subjects Based on Educational Function, and Value, Class- ification of. LYMAN C. WOOSTER.....	550
Science and Humanism. LYNN HAROLD HOUGH.....	97
Science Instruction in Secondary Schools, Present Needs of. ROBERT A. MILLIKAN.....	101
Science Questions. FRANKLIN T. JONES.....	92, 177, 273, 368, 556, 646, 858
Singing Tube, A Convenient Form of the New. CHARLES T. KNIPP.....	787
Slide Rules, Talk on Logarithms and. FLORIAN CAJORI.....	527
Spherical Triangles, The Graphical Solution of. MYRON O. TRIPP.....	734
Such is Life. ELEANOR J. OLMSTEAD.....	135

Summer Resorts in Southwestern Maine, Maps of. U. S. GEOL. SURVEY.....	750
Snowstorm in Palestine, February, 1920, Tremendous. OTIS A. GLAZEBROOK.....	760
Sunset-Midway Oil District of California, Government Report on the. Surveys, West Indian. U. S. GEOL. SURVEY.....	564 139

T

Tale and Soapstone Industry. U. S. GEOL. SURVEY.....	442
Teachers Suffer Most. INDUSTRIAL CONFERENCE.....	549
Teacher Teach, Helping the. U. S. DEPT. OF AGRICULTURE.....	26
Teaching Method, The Project As a. R. W. SHARPE.....	20
Teaching of Geography and the World War, The. H. E. BRANOM.....	758
Teaching of Science and Mathematics, The Relations of Vocational Guidance of Our. ANNA Y. REED.....	105
Teaching of Science, English Expression in its Relation to. R. R. SMITH.....	341
Teaching the Absolute Zero, A Suggestion for. G. W. WARNER.....	361
Test in Science Revised, The Range of Information. ELLIOT R. DOWNING.....	77
Tests in Science, Standardized. RALPH E. WAGER.....	66
Theorem of Nicomachus, The. OSCAR SCHMIEDEL.....	462
(Thermionic) X-Ray Tube, The Coolidge. HOMER L. DODGE.....	337
Time, Rate and Distance Problems. JOS. A. NYBERG.....	539
Tin, Alaska Produces. U. S. GEOL. SURVEY.....	124
Top Reviewed, An Old Form of. CHARLES T. KNIPP.....	113
Treasurer, Report of the C. A. S. & M. T. JOHN H. McCLELLEN.....	236
Tuning Forks, A New Method of Rating. F. RENWICK.....	143

U

University of Michigan Summer School for Biology.....	572
---	-----

V

Vacuum Gage, A New Direct Reading. W. H. FARR.....	495
Visual Education, The Scope and Outlook of. J. PAUL GOODE.....	482
Vocational Chemistry, How Does the Present High School Course in Chemistry Meet the Demands of. FRANK B. WADE.....	313
Vocational Education, General Science and. A. W. NOLAN.....	454
Vocational Guidance to Our Teaching of Science and Mathematics, The Relation of. ANNA Y. REED.....	105

W

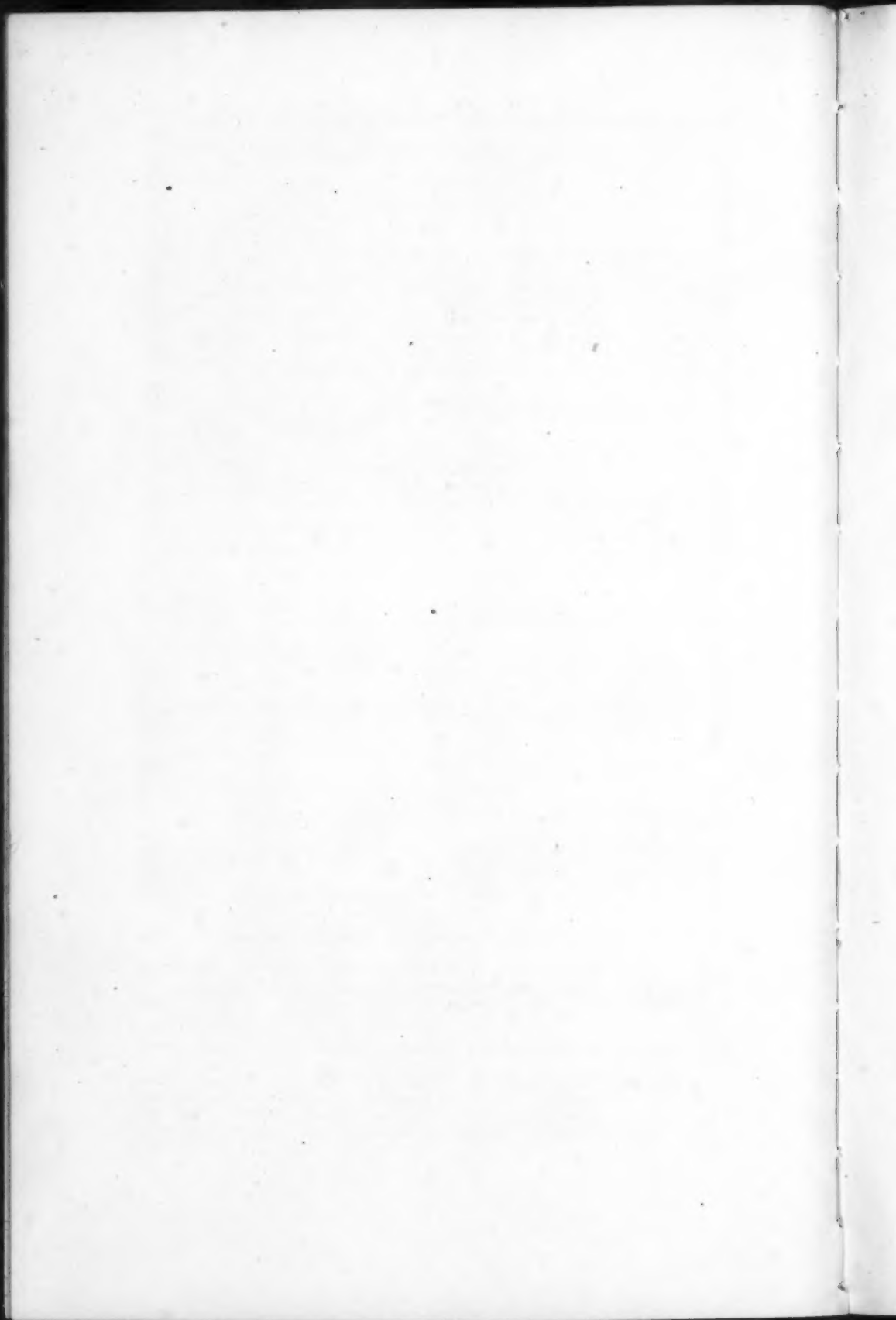
Water Wheels Manufactured in the United States, Shipments in 1918 of. U. S. GEOL. SURVEY.....	84
Water Power in Southeastern Alaska. U. S. GEOL. SURVEY.....	181
Weather Prophets, Animal. SCIENTIFIC AMERICAN.....	748
Weight of Data. J. P. BALLANTINE.....	140

X

X-Ray Tube, The Coolidge (Thermionic). HOMER L. DODGE.....	337
--	-----

Z

Zero and Unity, Some Applications of the Various Forms of. RICHARD MORRIS.....	544
--	-----



INDEX BY AUTHORS

A

AITCHISON, ALISON E., Cedar Falls, Ia.....	499
AMES, JOSEPH S., Johns Hopkins University.....	477
ANDEREGG, L. O., Purdue University.....	571
ANNING, NORMAN, Orono, Maine.....	271, 366, 367, 465, 467, 639
ARLEIGH, MABEL W., South Pasadena, Calif.....	629
AUGER, A. W., Tilden High School, Chicago.....	266

B

BAILEY, WILLIAM, Dickinson High School, Newark, N. J.....	175
BALLANTINE, J. P., The University of Maine.....	140
BARKER, EUGENE H., Polytechnic High School, Los Angeles.....	46
BAROTZ, N., New York City.....	86, 270, 554, 555
BOSS, LEWIS J., Popular Astronomy.....	487
BOREMAN, ROBT. W., School of Technology, Atlanta, Ga.....	179
BOWDEN, G. A., University School, Cincinnati.....	327
BRANOM, FRED K., Chicago Normal College.....	157
BRANOM, H. E., Harris Teacher College, St. Louis.....	758
BRESLICH, E. R., School of Education, The University of Chicago.....	125
BROWN, THOS. G., Boys' Technical High School, Milwaukee, Wis.....	466
BROWN, WILLIAM H., High School, Amherst, Mass.....	270
BROWNELL, HERBERT, University of Nebraska, Lincoln.....	317
BUREAU OF EDUCATION.....	644

C

CAJORI, FLORIAN, University of California.....	527
CARNEGIE CORPORATION, New York City.....	312
CARTER, W. S., Chief Supt. of Education, Fredericton, New Brunswick.....	273
CLARK AGENCY, Chicago.....	363
COBB, HERBERT E., Lewis Institute, Chicago.....	278, 374, 375, 376, 560, 664, 666
COLLINS, JOSEPH V., Normal School, Stevens Point, Wis.....	416
CONRAD, HENRY S.....	558
CORRECTIONS.....	45
CORZINE, H. W., Cleveland, Ohio.....	558

D

DAVIS, ALFRED, Soldan High School, St. Louis.....	382
DAVIS, BRADLEY M., University of Michigan.....	52, 352, 692
DAVIS, JEHIEL S., Prescott, Arizona.....	57
DEPARTMENT OF THE INTERIOR.....	84, 181
DODGE, HOMER L., University of Oklahoma.....	337, 681
DONOVAN, HAROLD G., High School, Concord, N. H.....	554, 638
DOUGLAS, H. R., University of Oregon.....	287
DOWNING, DR. ELLIOTT R., University of Chicago.....	77
DRUCKER, A. P. R., Colorado State College, Colorado Springs.....	70
DULL, CHARLES E., South Side High School, Newark.....	841

E

EATON, EDITH ST. JOHN, Berkeley, Calif.....	443
EATON, T. E. N., High School, Redlands, Calif.....	367
EPPELSON, C. A., Teachers College, Kirksville, Mo.....	210

F

FARR, W. H., Central Scientific Co., Chicago.....	144, 495
FELDMANN, L. C., High School, Oshkosh, Wis.....	700
FINGER, C. P., Ferndale, Calif., Union School.....	472
FINLEY, CHAS. W., Lincoln School, Teachers College, Columbia Univ.....	782
FISHER, WILLARD J., Woods Hole, Mass.....	723
FREEMAN, FRANK N., University of Chicago.....	475

G

GERRY, HENRY L. Worcester, Mass., Academy.....	845
GILLET, HARRY O., The University of Chicago.....	232
GINN & Co., Boston, Mass.....	186
GLAZEBROOK, OTIS A., Jerusalem, Palestine.....	760
GLENN, EARL R., Lincoln School, Teachers College, Columbia Univ.	782
GOODE, J. PAUL, University of Chicago.....	234, 482
GORDON, NEIL E., Maryland State College, College Parks.....	419
GRAHAM, MARIA D., North Carolina College for Women, Greensboro	378
GREENE, JAS. H., University of Illinois.....	788
GUNTROOP, HORACE, Washburn College, Topeka, Kan.....	383

H

HAMMOND, PHILO F., University of Wyoming.....	714
HANNA, JOHN CALVIN, State Supervisor of High Schools, Spring-	
field, Ill.....	241, 516
HARKIN, WILLIAM D., University of Chicago.....	392, 501
HARRINGTON, HELENA M., Saint Clara College, Sinsinawa, Wis.....	366
HARRIS, ISABEL, Richmond, Va.....	731
HASSLER, J. O., Crane Junior College, Chicago.....	86, 175, 270
HERZBERG, MAX J., Central High School, Newark.....	697
HILGER, ADAM, London, Eng.....	762
HINSEL, C. M., High School, Des Plaines, Ill.....	535
HIRSHBERG, LEONARD K.....	820
HOPKINS, B. S., University of Illinois.....	392, 571, 673
HOUGH, LYNN HAROLD, President Northwestern University.....	97
HULBERT, HAROLD S., U. S. Navy.....	147

I

ISENBORGER, JEROME, Lake View High School, Chicago.....	642
---	-----

J

JAMES, CLARKE, High School, San Jose, Calif.....	744
JOHNSON, E. H., Kenyon College, Gambier, Ohio.....	14
JOHNSON, MYRTLE E., High School, Pasadena.....	779
JONES, FRANKLIN T., Warner and Swasey Co., Cleveland.....	92, 177, 273, 368, 556, 646, 858
JONES, HAZEL C., Danville, Ill.....	174

K

KAMPLAIN, J. CARL, Crane Junior College, Chicago.....	51, 175
KARPINSKI, LOUIS C., University of Michigan.....	821
KEENE, DEAN E. S., School of Mechanic Arts, Fargo, N. D.....	583
KNIPP, CHARLES T., University of Illinois.....	113, 787
KNOWLES, ROBERT R., High School, Sterling, Col.....	562
KNUPP, N. D., Santa Monica High School, California.....	558
KRENERICK, H. C., North Division High School, Milwaukee, Wis....	197

L

LACKEY, E. E., Normal School, Wayne, Neb.....	872
LEESON, C. C., Teachers College, Maryville, Mo.....	752
LEMON, HARVEY B., The University of Chicago.....	226
LEWIS, S. R., Chicago, Ill.....	448
LINDQUEST, THEODORE, Normal School, Emporia, Kansas.....	305

M

MACK, F. D., La Crosse, Wis.....	275
MALONE, W. L., Tacoma, Washington.....	275
MCCLELLAN, JOHN H., Harrison High School, Chicago.....	236
McCONNELL, W. R., Miami University, Oxford, Ohio.....	117
McCoy, WILLIAM T., Phillips High School, Chicago.....	141
McGREGOR, R. T., Elk Grove, Col.....	87, 271
McMACKIN, FRANK H., Dickinson High School, Newark.....	640

McPHERSON, WILLIAM, Ohio State University.....	200
MESS, HARRY M., Senn High School, Chicago.....	240
MILLAR, R. W., University of Illinois.....	512
MILLER, G. A., University of Illinois.....	300, 813
MILLIKAN, ROBERT A., The University of Chicago.....	101
MONTHLY WEATHER REVIEW, Washington.....	758, 760
MOORE, C. N., University of Cincinnati.....	438
MORTZ, ROBERT E., University of Washington, Seattle.....	433
MORRIS, RICHARD, Rutgers College.....	544
MOUNCE, GEORGE, High School, LaSalle, Ill.....	632

N

NATIONAL ACADEMY OF SCIENCES, Washington, D. C.....	363
NATIONAL RESEARCH COUNCIL, Washington, D. C.....	362, 749
NELSON, W. E., Sabetha, Kan.....	166
NICHOLS, ANDREW, Austin High School, Chicago.....	706
NOLAN, A. W., University of Illinois.....	454
NYBERG, JOS. A., Hyde Park High School, Chicago.....	365, 435, 465, 539, 554, 619, 637, 743, 829, 854

O

OLMSTEAD, ELEANOR J., High School, Antigo, Wis.....	135
OSMOND, I. THORNTON, State College, Penn.....	602

P

PACKARD, J. C., Brookline, Mass.....	558
PACKHAM, JAS. H., Collegiate Institute, Owen Sound, Ga. 555, 638,	743
PAGELOW, WM. A., Dickinson High School, Newark.....	638
PANDYA, N. P., Amreli, India.....	90
PARKER, ELSIE G., Oak Park High School, Oak Park, Ill.....	264
PELLETIER, G., Ecole Polytechnique, Montreal, Can.....	86, 87, 88, 175, 176, 271, 466, 554, 639, 743, 744
PERSING, ELLIS C., Glenville High School, Cleveland.....	797
PHOTO-ERA, Boston, Mass.....	391
PIEFER, CHARLES J., University High School, Chicago.....	409
PIERCE, EDWIN G., East Technical High School, Cleveland.....	27
PUBLIC HEALTH SERVICE.....	326

R

REED, ANNA Y., United States Employment Service, Washington, D. C.....	105
REEDY, J. H., University of Illinois.....	673
RENWICK, F.....	143
RICH, DANIEL L., University of Michigan.....	220
RICH, FRANK M., School 19, Paterson, N. J.....	34
RIGGE, WILLIAM F., Creighton University, Omaha, Neb.....	172
ROALFE, GEORGE D., Los Angeles, Calif.....	801
ROECKER, W. F., Technical High School, Milwaukee, Wis.....	142
RORAY, NELSON L., Metuchen, N. J.....	175, 554, 638
ROSE, ROBERT E., Wilmington, Del.....	868
ROYSTON, ANNE B., Hyde Park High School, Chicago.....	251
RUCH, G. M., University of Oregon, Eugene.....	423

S

SCHMIEDEL, OSCAR, Parsons College, Fairfield, Iowa.....	462
SCHOOL REVIEW, University of Chicago Press.....	182
SCHRIEVER, WILLIAM, University of Oklahoma.....	681
SCHUCKER, M. G., Peabody High School, Pittsburgh, Pa., 86, 365, 637,	818
SCIENTIFIC AMERICAN, New York City.....	748
SHARPE, R. W., DeWitt Clinton High School, New York City.....	20
SHINN, H. B., Schurz High School, Chicago.....	656
SKLAR, LOUIS, Drexel Institute, Philadelphia.....	86, 743

SMITH, CHARLES H., Hyde Park High School, Chicago.....	85, 96, 184, 185, 187, 188, 190, 192, 269, 272, 275, 278, 284, 456, 468, 470, 472, 474, 559, 566, 649, 654, 656, 662, 668, 747, 768, 770, 772, 774, 866
SMITH, H. R., Lake View High School, Chicago.....	561
SMITH, JAMES H., Austin High School, Chicago.....	256
SMITH, R. R., School of Engineering, Milwaukee.....	341
SPURGIN, W. H., Hyde Park High School, Chicago.....	488
STEATER, W. W., University of Michigan.....	612
STEWART, ROLLAND M., Cornell University.....	594
STONE, C. A., High School, Des Plaines, Ill.....	855
STROMQUIST, C. EBEN, University of Wyoming.....	624
STUART, MAUD S., Faribault, Minn.....	553
SYPE, GEORGE H., Austin High School, Chicago.....	233

T

TAYLOR, J. NORMAN, Washington Preparatory School, D. C.....	514, 850
THOMAS E. N., Eaton High School, Redlands, Cal.....	745
TRIPP, MYRON O., University of Maine.....	734
TWISS, GEORGE R., Ohio State University.....	1

U

U. S. DEPT. OF AGRICULTURE.....	26
U. S. GEOL. SURVEY.....	19, 26, 33, 51, 84, 91, 100, 112, 134, 139, 150, 173, 181, 196, 364, 391, 437, 442, 494, 515, 564, 565, 576, 636, 641, 696, 733, 748, 750, 876

V

VAN CLEAVE, H. J., University of Illinois.....	652
VESTAL, C. L., Schurz High School, Chicago.....	151
VISHER, STEPHEN S., Indiana University.....	608

W

WADE, FRANK B., Shortridge High School, Indianapolis.....	282, 313, 377, 403, 660, 775
WAGER, RALPH E., Normal School, DeKalb, Ill.....	66
WARNE, WALTER R., State College, Penn.....	270, 465, 554, 637, 744
WARNER, G. W., Englewood High School, Chicago.....	361
WATSON, E. E., Parsons College, Ia.....	531
WATSON, F. R., The University of Illinois.....	193
WECKEL, ADA L., Oak Park High School, Oak Park, Ill.....	257
WESTON, MARION D., Rhode College of Education.....	577
WHITAKER, HELEN, Topeka, Kansas.....	457
WHITAKER, HERBERT C., Philadelphia, Pa.....	270, 271, 744
WHITNEY, WARROLO, Hyde Park High School, Chicago.....	280
WILLIAMS, F. E., University of Wisconsin.....	347
WILLIAMS, S. H., Normal School, Slippery Rock, Penn.....	838
WINSLOW, CHARLES S., Senn High School, Chicago.....	233
WOODRUFF, SYBIL.....	261
WOOSTER, LYMAN C., Normal School, Emporia, Kansas.....	550, 792
WORLD TRADE CLUB, San Francisco, Calif.....	13, 33, 65, 156, 182, 364

Y

YOUNG, J. W., Dartmouth College.....	476, 754, 764
--------------------------------------	---------------

